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The Profession's Weekly Journal

IT is now almost five years since the Officers and Council of the Association approved a modified system of management for THE VETERINARY RECORD. This took the form of a small committee of knowledgeable and enthusiastic veterinary surgeons, meeting not at set intervals, but at such times as matters of moment, rather than of routine or detail, needed to be discussed. The President, at that time, speaking unofficially, envisaged the possibility of some kind of "five-year plan" for the modernisation of the journal, and it may be useful to glance back over those years, and forward towards the next five. That certain advances have been made is hardly to be denied. THE RECORD has an up-to-date format and a cover design which seems to give general satisfaction; it has a reasonable variety of content presented at an acceptable standard; its revenues are far in advance of anything in its recorded history, and, perhaps best of all, it enjoys an increasing circulation among readers who are not members of the B.V.A. Some veterinary surgeons may be surprised to know that this part of the journal's circulation is more than half as great as the total membership, and includes, among others, readers in many parts of Europe, in the United States, and in China.

Among problems which remain to be solved, two stand out. We still do not publish as much clinical material as could be wished, and we are still unable to fulfil completely the function of a veterinary newspaper. The first of these problems is chronic, and goes back to the editorship of William Hunting. He, and all his successors, have appealed at regular and constant intervals to clinicians, but the appeals have been only partially heeded. Within the past two or three years the William Hunting Awards have encouraged some increase in the amount of clinical material offered for publication, but our journal remains to some extent out of balance until more—and more regular—contributions are forthcoming. This is a matter which only the clinicians themselves can deal with: it is fruitless for critics to grumble when, out of some three thousand veterinary surgeons in private practice, at least ninety-five per cent. never submit a paper.

In the provision of topical news comparisons are sometimes made between THE VETERINARY RECORD and the farming journals. Such comparisons take no account of the realities, or the economics, of weekly journalism. It is outside the scope of practical politics for the official organ of a learned profession, small in numbers, to compete on an equal footing with great commercial undertakings having almost unlimited resources in finance and manpower, together with all the mechanical apparatus of large-scale journalism. The only compensating factor is the willingness of individuals voluntarily to supply news items which become known to them in the course of their daily work. In this connexion the notes regularly received from our University correspondents may be cited. THE VETERINARY RECORD is, indeed, most fortunate in the number of those who, as scrutineers, reviewers, abstractors, and expert correspondents provide free, or virtually free of charge, services which otherwise would bear heavily upon the Association's finances. Looking to the future, it would seem that the most obvious necessity for THE RECORD's development is to increase the number of these indispensable voluntary assistants, and to express the hope that members of the B.V.A. will be good enough to act, whenever the occasion arises, as our "reporters," even though they do no more than advise us of the outlines of interesting professional or scientific developments, or public events they may be attending, so that we can arrange to cover these matters and give a topical account of them.

Methods for the Control of the Aspecific Type of Bovine Mastitis

BY
JOHN MAFFEY
Veterinary Investigation Centre, Bristol

SUMMARY.—The investigation into 234 herd outbreaks of mastitis in the counties of Somerset, Gloucester, and Wiltshire are described.

In 198 of these outbreaks assessed as aspecific, resolution was assumed in 80 per cent. in 4 to 6 weeks.

Control methods are given in detail, both with regard to the technique of efficient machine milking and adjustments to the machine itself.

Introduction

IN recent years it has been the experience of many workers investigating herd outbreaks of mastitis to find the largest proportion of outbreaks due to infections other than *Streptococcus agalactiae*, the examination of milk samples usually revealing a wide variety of organisms, chiefly staphylococci. The indication is that some stress factor is operating on a herd basis which lowers the resistance of udder tissue to those organisms permanently present in the environment. Control of such aspecific or "non-contagious" outbreaks of mastitis is therefore only possible through the removal of the stress factor, this being followed by a progressive decrease in clinical cases to a level at which a herd problem no longer exists.

Although a number of stress factors or "trigger mechanisms" have been implicated in disturbing the balance of the host-parasite relationship on a herd basis, it is recognised that the most likely by far is that occurring during milking, and resulting from machine vacuum operating at the teat (Wilson, 1954, 1958).

The object of this paper is to indicate the results obtained in 234 herds where mastitis outbreaks were investigated under field conditions during the period September 1st, 1953, to June 30th, 1957. It is not possible to elaborate on the various aspects of machine "failure" in a paper of this nature, and it is hoped to deal specifically with this aspect in a subsequent publication.

Method

The investigation of aspecific mastitis was conducted with 3 main considerations in mind: herd history, bacteriological examination of milk samples, and investigation on the farm. As much information as possible was obtained from the veterinary surgeon in attendance, arrangements made for bacteriological examination of milk samples and a visit was paid to the farm to check the machine and the milking methods. Appropriate measures of control were then indicated.

I. Herd Histories

The clinical picture of disease occurring in each outbreak was confirmed in conversation with cowmen. The actual cows affected were not consistently examined. In all cases the history included a drop in milk yield in cows and where possible this was checked against milk records. Clots were present in the milk and the udder reaction varied from diffuse hardness with heat down to little palpable change. Disease had been present in each herd for at least 2 months before the investigation, and primarily in lactating animals.

II. Bacteriology

(a) *Sampling and Testing*

A bacteriological examination of milk samples in each herd was carried out during the period September, 1953, to January, 1957. Sampling was carried out by the owner using bottles either left on the farm at the time of visiting or sent by post. In summer months 1 ml. of a 1 per cent. solution of boric acid was dispensed in each bottle as a preservative. Subsequent to January, 1957, whole herd tests were discontinued owing to the work involved, and owners submitted individual pre-treatment samples from clinical cases occurring after the initial visit for investigation.

After each herd test, except in the case of *Str. agalactiae*, outbreaks which were dealt with as contagious disease by periodic resampling under the A.R.C. recommendations (1955), a further supply of milk sampling bottles was sent to each owner in order to assess resolution of the outbreak.

Samples were cultured on 5 per cent. ox-blood agar and Edward's medium, using a loopful (0.015 ml.) of milk and streaked on to half plates of each medium, and incubated aerobically at 37.5° C. for 48 hours. The usual inoculum of 0.1 ml. of milk delivered by pipette and distributed by a spreader could not be made under routine conditions.

Suspect colonies of streptococci were typed by the method described by Wilson and Slavin (1950) by streaking them up to a ditch containing Staph. β toxin, cut in a medium of 5 per cent. sheep-blood agar containing 1/1,000 aesculin. Aesculin splitting streptococci were further classified by inoculating into 1/1,000 methylene blue milk to eliminate *Str. lactis* and *Str. faecalis* while β wide-zone streptococci were typed for their Lancefield group by the tube precipitation test. Haemolytic staphylococci were classified as *Staph. pyogenes* if positive to the slide coagulase test up to January, 1956, but subsequently this test was discontinued when it was found that 87 per cent. of 4,001 isolations were positive.

(b) *Results*

In all, 234 initial visits were made to investigate herd outbreaks of disease. A total of 180 milking

herds were milk sampled for bacteriological examination with the following results:—

Herds	Average number of cows	The number of herds with		
		Str. agalactiae		Non-contagious organisms
		Exceeding 5 per cent.	Less than 5 per cent.	
180	36	29	45	106

The summaries of the types of organisms isolated from the above 3 groups are:—

(1) *Str. agalactiae* herds, exceeding 5 per cent. infection.

Herds	Average number of cows	The number of isolations of			
		Streptococci			*Staph. pyogenes*
		Agalactiae	*Dysgalactiae*	*Uberis*	
29	39	284	49	51	408

(2) *Str. agalactiae* herds, less than 5 per cent. infection.

Herds	Average number of cows	The number of isolations of			
		Streptococci			*Staph. pyogenes*
		Agalactiae	*Dysgalactiae*	*Uberis*	
45	38	90	83	98	706

(3) Herds with non-contagious infections.

Herds	Average number of cows	The number of isolations of			
		Streptococci			*Staph. pyogenes*
		Dysgalactiae	*Uberis*	Other groups	
106	30	131	205	55	1,161

Isolations of *Escherichia coli* have been omitted owing to their doubtful significance, together with occasional recoveries of *Ps. pyocyanea*, saprophytic acid-fast bacilli, and yeast-like organisms. These bacteriological results indicate the prevailing types of organisms, although their number is influenced by the amount of antibiotic treatment in the herd at the time of sampling.

From the remaining 54 herds of the 234 investigated, owners submitted pre-treatment milk samples from clinical cases of disease subsequent to the visits, but no complete herd tests were carried out. *Str. agalactiae* was recovered from 7 of these herds, and are excluded from the total of non-contagious outbreaks. With these 47 herds and the herds in (2) and (3) above, a total of 198 outbreaks of aspecific mastitis were investigated.

III. Farm Investigation

This was made in company with the owner and both regular and relief cowmen to discuss cowmanship and machine management. It allowed for a valuable interchange of opinion on all sides on the best way to apply the advice which was given, especially as regards division of labour in the milking routine. Every herd was un unknown quantity as regards the milking speed of each cow as governed by the stage in lactation and teat sphincter diameter. The various factors which were investigated on the farm and the findings are detailed below.

(1) *Cowmanship*

Almost without exception, in the herds concerned, milking methods were inefficient. Fig. 1 shows the average milking time per cow in 172 of the herds investigated. In 117 herds the average time was between 8 to 12 minutes per cow. Most cowmen are conversant with the milk ejection mechanism, although not so many are aware that it is of a transitory nature; in 12 herds pre-washing was a feature of routine. Slow milking resulted from the use of too many machine units and to overstripping in the belief that this latter was beneficial or influenced yields.

AVERAGE MILKING TIME PER COW IN MINUTES IN 171 HERDS IN WHICH MASTITIS OUTBREAKS EXISTED

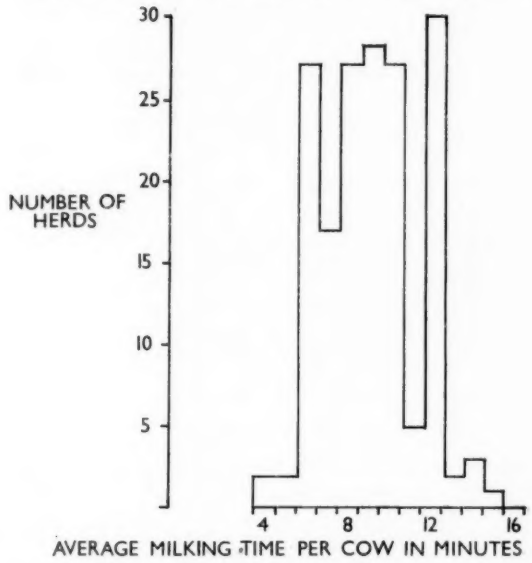

FIG. 1

(2) *Machine Management*

(a) *Teat Cup Liners.* All the designs of teat cup liners of the various manufacturers, Alfa-Laval, Gascoigne, Fullwood, Manus, Simplex, Vaccar, Wallace, and Westfalia-Macford were encountered in outbreaks, with the exception of Hosier and Surge-Melotte. These latter 2 types are not in common use, however, and their exclusion is not of significance.

The liner type implicated by Wilson (1952) and Dodd *et al.* (1957) in controlled experiments as causing a higher incidence of disease was found in 18 of the 198 herds, and its change to a more suitable design incorporating a softer mouthpiece and high longitudinal tension, was attended in each case by resolution. This was carried out within the same machine make and with the co-operation of the machine company's representative, yet the liner which

was discarded in these cases is still on the market. With one company's unit it was necessary to change only the liner type, but with another make completely new shells and liners were necessary to effect the changeover. Although this occasioned expense for the owner it was considered justified. In one case of another make of machine with a liner of a heavy moulded type the complete bucket units were replaced after continuing disease for a year. This was thought advisable in the long run, in view of the findings in Ayrshire of Watts (1951) where herds milked with this type of machine showed a higher incidence of mastitis due to streptococci, including *Str. agalactiae*. In a controlled experiment in one of these herds Watts showed a drop in infection rate of quarters from 50 per cent. to 20 per cent. in the course of a year, after the machine was changed. The aspecific outbreak in the Bristol herd responded to this measure.

In 13 other investigations advice was given to replace a liner with a hard moulded mouthpiece by an extruded liner with a soft mouthpiece within the same make. Liners with hard mouthpieces leave more milk in the udder to be removed as strippings (Dodd, 1957), and there is evidence that this feature of the liner causes teat irritation during milk flow sufficient to promote mastitis (Dodd *et al.*, 1957; Neave, 1957).

Wide-bore liners (1″ or more in internal diameter) were being used in 16 herds, and in these outbreaks the number of machines per man was reduced to allow cows to be attended promptly at the stripping point. This is necessary with a wide-bore liner as the force of vacuum is particularly high on the teat at this time. Force is defined as pressure per unit area and 15″ of mercury vacuum is equal to 7½ lb. to the square inch. A narrow-bore liner confines vacuum force to the teat end throughout milking, but a wide-bore liner, greater than the diameter of the teat, only during milk flow; the positive pressure of the milk within the teat and the negative pressure without expands the teat to meet the liner walls during milking. But at the stripping point, when milk flow is suspended, pressure levels inside and outside the teat are equal, the teat resumes its normal size, and vacuum operates over the increased area of the whole teat. This is seen in the radiographic studies of Pier *et al.* (1956), and an idea of the magnitude of the force on the teat at the stripping point can be gained by assuming a teat size of 2″ × ¾″, an area of 5 square inches, when the force is approximately 37 lb. for a vacuum of 15″ Hg. Cowmen were successful in controlling disease in all the 16 herds with the adjustment of the division of labour to the machine units and when the action of a wide-bore liner was explained to them.

In only 12 of the 198 herds were liners maintained by the cold caustic soak which is essential for liner efficiency (Garner and Berridge, 1952). Butterfat is rapidly absorbed by rubber causing it to swell and distort with loss of milking efficiency. If 2 sets of liners are used, and alternated in the clusters weekly, the set at rest can be soaked in a 5 per cent. solution of caustic soda and the fat removed soon after it is absorbed. The caustic solution remains effective for 2 months and is held in a glass container as it attacks metals except stainless steel. Rubber liners are washed before re-use to remove excess caustic. The method has the added attraction of increasing the "life" of liners; 2 sets of the extruded type last from 6 to 9 months and the moulded type about 9 to 12 months.

(b) *Vacuum.* Adjustments to the vacuum system of the machine were necessary in a number of cases to assist cowmen to milk efficiently. Vacuum level is chiefly governed by the weighted valve of the vacuum controller provided it is sustained by a vacuum pump of sufficient capacity to supply all the demands of the machine during milking.

The vacuum level was adjusted up to 13″ Hg in 2 cases on bucket plants and up to 15″ Hg on 42 auto-recorder machines. In the latter machine milk flow from the cluster is against gravity to the overhead milk line and the column of air and milk in the long milk tube causes a drop in vacuum at the cluster. A 15″ Hg vacuum thus gives approximately 13″ at the cluster. The adjustment was carried out at the vacuum controller with the assistance of the machine company's representative.

This level proved high enough for rapid milking and the control of mastitis. But it cannot be regarded as optimal since milking has been carried out at 20″ Hg vacuum without an increase in the incidence of mastitis, under controlled conditions (Neave, 1957), and as high vacuum increases the flow of milk (N.I.R.D., 1955). Consequently, although in 6 of the Bristol outbreaks cows were being milked at vacuum levels up to 17″ Hg these were not reduced except in 2 instances. In these latter 2 outbreaks the machine was milking faster than cowmen could attend their cows and overmilking resulted.

Milking at high vacuum demands not only additional labour, but the machine itself requires a larger vacuum supply. The higher the operational vacuum, the less efficient is the vacuum pump and the greater the machine consumption of vacuum as there is more air to exhaust from the pulsation system. It is therefore unwise for vacuum levels on machines to be raised arbitrarily.

Vacuum pumps were low in capacity in 12 outbreaks so that a fluctuating vacuum level existed during milking, but in a large number of cases vacuum controller action was inefficient due to corrosion and worn valve seatings so that vacuum control was defective.

In all cases advice was given that the air line should be washed out regularly so that vacuum reached the units without obstruction, and that leaks in the line were detrimental, but other than this no check was made on these factors.

(c) *Pulsation.* In all outbreaks there was some variation in the rate of pulsators on different units but the variation was not always wide enough to cause serious disturbance to the cows if by chance they were milked on a unit with a changed pulsator rate.

In 2 cases pulsator rates in excess of 100 per minute were associated with outbreaks probably due

to the vacuum level being affected by excessive machine consumption of vacuum, for in general pulsators use 90 per cent. of the machine consumption of vacuum.

Three outbreaks of mastitis occurred following the introduction of a pulsation ratio of 3:1, when the time of operation of the milking phase in relation to the squeeze phase in the pulsation cycle was trebled. Two resolved when the labour force was adjusted to the increased milking speed of the machine, and the third when the ratio was restored to 1:1. Change in the pulsation ratio considerably increases the milking speed of a machine; a change in ratio from 1:1 to 4:1 shows an increase of 40 to 50 per cent. (Dodd, 1957).

(d) *Cluster Weights.* These were adjusted in 10 cases as they had been lightened by introducing stainless-steel shells where brass shells had been in use previously, as it has been shown that light clusters leave more milk as strippings (Dodd and Henriques, 1949). The comparable heavier clawpiece for stainless-steel shells brought the cluster weight up to standard.

(e) *Clawpiece Air Admission Holes.* Approximately 40 machines of the auto-recorder type were encountered where air admission from the clawpiece was not taking place, and this was rectified by introducing a hole approximately 1/32 inch in diameter. As previously described, in the auto-recorder machine an adjustment of vacuum level is necessary to obtain an operational vacuum of 13″ Hg at the cluster. This was to 15″ to compensate for the drop in vacuum caused by the flow of milk against gravity. This increase of 2″ is adequate, however, only if a mixture of air and milk forms the flow, it is considerably greater for solid milk owing to its greater density, so that provision has to be made for air admission at the clawpiece. By obstructing these air holes, Hopkirk *et al.* (1943) were able to precipitate an outbreak of mastitis in an experimental herd within 18 hours. It is uncertain, however, if this was an aspecific outbreak since streptococcal infections were not classified.

(f) *Visual Aid to Milking.* The Ruakura Milk Flow Indicator was fitted to 6 machines with satisfactory results, to assist cowmen in assessing the stripping point of their cows in terms of milk flow in lb. per minute (Whittlestone, 1954; N.I.R.D., 1952). The indicator is not subject to the drawbacks of the ordinary sight glass which frequently gives the impression of milk flow when milk is, in reality, oscillating or frothing in the milk line.

(3) *Treatment of Clinical Cases*

In the treatment of established cases of disease in outbreaks the choice of antibiotic was guided by the trials carried out by Wilson (1954).

Usually these consisted of antibiotics selective against staphylococci as this is the main pathogen. The synergistic action of penicillin and streptomycin was effective in the treatment of the majority of staphylococcal cases.

Cows disclosed as infected with this organism at the herd test of milk samples were recommended not to be treated unless they were clinical cases. This was in view of the work by Stuart (1954), Blackburn (1953), and others.

Outbreaks of teat sores involving most of the cows in the herd occurred in 5 herds, but only in 2 of these could disease be controlled.

Assessment of Results

The result on each farm was assessed by the number of pre-treatment samples received at the laboratory from clinical cases subsequent to the visit to investigate disease. If after the elapse of 4 to 6 weeks the number received indicated that the outbreak was not subsiding, a re-visit to the farm was made. This was necessary in 43 of the outbreaks. Complete resolution of 90 per cent. of outbreaks was estimated by this method.

Veterinary surgeons were also asked to comment on the results in the herds of their clients, and from the random sample of 41 returns out of 62 requests circulated, their assessment was 80 per cent. The numbers involved are as follows:—

(1) *From the Laboratory.*

Number of non-contagious outbreaks	Resolution of outbreak	Disease unchecked after 12 weeks, *i.e.* no resolution
198	179	19

(2) *From the Veterinary Surgeon.*

Number of non-contagious outbreaks	Resolution of herd outbreak	Partial resolution of herd outbreak	No resolution of herd outbreak
126	101	16	9

Excluding the last 54 cases in which no herd test was carried out, *i.e.* cases dealt with after 1.2.57, and all the herds showing *Str. agalactiae* infection to any degree, these results assessed by veterinary surgeons after the lapse of at least 5 months since the investigation are:—

Number of non-contagious outbreaks	Resolution of herd outbreak	Partial resolution of herd outbreak	No resolution of herd outbreak
71	57	6	8

The percentage of complete resolution thus remains the same at 80 per cent., although over fewer outbreaks.

Recommendations for Control

(1) *Cowmanship*

Good cowmanship is of first importance in mastitis control, so that the measure of success is the measure of co-operation on the farm. Cowmen must milk individually and as a team over a period of weeks in the face of continuing disease and yet have confidence that they are moving on the right lines. The best method of approach to achieve co-operation in the majority of cases appears to lies in a thorough

explanation of sound milking technique, and of the physical principles of machine operation and maintenance.

(2) *Milking Technique*

An efficient technique consists of a fast milking routine with machines on the cow only during milk flow; a combination of response by the cow to the action of the machine mediated by cowmanship. A good complete milk ejection is provoked by a vigorous stimulus to the udder with hot water, and with clusters applied a minute later. They can be removed from the average cow within 6 minutes after brief pressure on the claw to recover the strippings, an average milking speed of 10 cows per hour per unit. Palpation of the udder sinus is the cowman's guide as to time of removal.

A description of the physiology of milk ejection provides the reason for this and shows that hand massage is unnecessary. As milk flow is suspended at the stripping point due to teat cup "crawl," with the accompanying pressure of the liner mouthpiece on the base of the teat, the stripping point in milking is as critical as when the cow is milked out. Finally, it is important to remove clusters promptly even though a little milk is left behind in the udder. This practice does not reduce milk yield nor butterfat percentage, nor as popularly believed, cause mastitis.

As cows are essentially creatures of habit, they respond readily to fast milking methods, say, in 48 hours, and to such changes as the cessation of hand stripping. Cows with tight teat sphincters that cannot respond to faster milking method (10-minute cows), or cows slow in one quarter (their yield in this quarter justifying its removal by hand) are best dealt with as problem cows. Every herd seems to have a few of these but if they are milked first or last as a group, routine will not be upset. Teat sphincter size is a highly hereditable factor (Dodd, 1953).

In conclusion, it is emphasised that fast milking takes precedence over all other considerations. Moreover cows can be milked in rotation without the danger of transmitting infection, although some of them have experienced recently an attack of aspecific mastitis. In such herds, also, it is unnecessary to dip clusters in a disinfectant solution between cows. Experience confirms that as long as a cow is milked efficiently the natural resistance of udder tissue is not interfered with and is adequate to resist invasion by organisms, essentially of low virulence, during milking. It is a moot point whether cluster disinfection reduces the number of organisms on the liner below an infective dose. It appears that the state of susceptibility of udder tisue is of prime importance. This observation is contrary to popular opinion that hygiene should occupy first place.

Discussion

In these investigations it was not possible to employ controls, so that some recoveries may have been fortuitous. However, in view of the obstinate nature of many outbreaks of aspecific mastitis it is felt that the results obtained justify the assumption that the conclusions must have some validity. Whilst the various milking machine factors have been discussed and a figure quoted for the times in which some adjustment led to improvement, it must be realised that other factors have been operating concurrently. Hence it is not possible to specify any special peculiarity of the milking machine as primarily responsible for an increase in the incidence of mastitis. Nevertheless the writer's experience is in line with the results recorded by Wilson (1952) and Dodd *et al.* (1957). These authors have reported the results of controlled experiments indicating the influence of liner design on the incidence of mastitis. Wilson reported on the results obtained where herds were divided into 2 equal groups, each group being milked with a different liner type. The incidence of mastitis was higher among the cows milked with a particular type of moulded liner as compared with the cows milked with the extruded type of liner. Dodd *et al.* (1957) contrasted the effect of these liners by arranging that the clusters carried liners of both types. This work confirmed their earlier finding that cows milked with an extruded liner had the higher maximum milking rate and lower quantity of strippings. Whilst neither Dodd nor Wilson indicated the precise factor responsible, Dodd (1957) suggested that it was the hard mouthpiece, an observation confirmed by Neave (1957).

Further work may show conclusively that other factors quoted in this paper may have comparable effects on the incidence of mastitis but until this has been demonstrated the results can only be reported without amplification.

The writer's experience, which is not unique, is that cowmanship may well be the most important single factor and cases may resolve if this is improved, without any adjustment to the milking machine. But it seems essential that cowmen should fully understand the influence of machine factors on the milking process if they are to milk efficiently over the necessary period to check disease.

The resolution of 80 per cent. of herds is regarded as sufficiently high to justify a continuation of this method of approach to the problem especially since the 20 per cent. of failures include farms where the advice offered was not taken. The method is not claimed as new—it is merely the application with certain variations of the method that has given satisfactory results at Weybridge.

Acknowledgments.—I should like to express my appreciation to Miss M. T. Mitchell for her valuable bacteriological work and to those milking machine companies whose representatives assisted in the servicing of milking plant on the farms where mastitis outbreaks occurred.

References

Agricultural Research Council (1955). *Vet Rec.* **67**. 410.
BLACKBURN, P. S. (1953). Private communication.
DODD, F. H., & HENRIQUES, E. (1949). *Agriculture.* **56**. 212.
———. (1953) *J. Dairy Res.* **20**. 138.
———, OLIVER, J., & NEAVE, F. K. (1957). *J. Dairy Res.* **24**. No. 1. 20.
———. (1957). Private communication.

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Agalactia of Sows Caused by Feeding the Ergot of the Bulrush Millet, *Pennisetum typhoides*

BY

D. K. SHONE, J. R. PHILIP, and G. J. CHRISTIE

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SUMMARY.—The agent responsible for the complete inhibition of the hypertrophy of the mammary glands of sows in the last few weeks of pregnancy, and the resultant agalactia and heavy mortality of piglets in Southern Rhodesia has been established as the ergot fungus parasitising the bulrush millet, Pennisetum typhoides.

The losses of piglets from this condition over the years 1953 to 1957 inclusive cannot be estimated but in one district the losses over a 4-month period were 675.

The general good health of all the affected sows and the complete absence of any of the symptoms usually associated with ergot poisoning, coupled with the limited information available on the alkaloids of the ergot of Pennisetum typhoides, *indicate that these alkaloids are different from those normally found in ergot.*

IN 1953 heavy losses occurred in newly-born piglets in the Umtali and Fort Victoria areas of Southern Rhodesia. Death of the piglets was from starvation ; the direct result of agalactia of the sows which was due to the complete or almost complete absence of any development of the mammary glands in the latter weeks of pregnancy and at parturition.

The recorded losses of piglets from starvation, due to this condition, were 675 in the Umtali area over a period of 4 months, but the mortality must in reality have been very much greater, as many farmers did not return figures (Hesketh, 1953). The deaths in the Fort Victoria area over a period of approximately 12 months were estimated at over 700 piglets (Ross, 1954). Further losses continued until the end of 1957 when it became possible to advise on what measures could be taken to prevent further mortality.

Early investigations (Lawrence & Ross, 1954) showed that the condition was not transmissible and that the aetiological factor was probably dietetic in origin.

In all the outbreaks it was stressed that affected sows did not at any time exhibit signs of ill health. Generally it was considered that the length of the gestation period was normal and the piglets were born alive and healthy. On 2 farms in the Fort Victoria area it was reported that some of the piglets of a litter were born alive, some dead, and others in varying stages of resorption. It was also considered that in some cases the gestation period was shorter than normal (Hesketh, 1953; Ross, 1954).

The work described below established that the agent responsible for the condition was the fungus ergot parasitising the grain of the bulrush millet, *Pennisetum typhoides*. This grain is better known in this country by the native name of " munga."

Pennisetum typhoides grows to a height of 6 to 8 feet and the seed is formed on a head resembling that of the bulrush, hence the name. This grain is grown chiefly by African farmers, and forms their staple diet in large areas of the country. Quantities, surplus to their requirements, are disposed of to the Grain Marketing Board of Southern Rhodesia, though some farmers living close to the reserves trade directly with the producers. The Grain Marketing Board redistributes the grain to feed firms, etc., chiefly for incorporation in stock feeds of which it has been found to be a valuable constituent particularly of bacon pig rations.

Experimental Work

Initially this investigation commenced in 1956 when millet was fed to white mice and it was shown that in contrast to the controls they failed to rear any young. In 1957, when some gilts became available, this work was repeated, but, owing to adverse housing conditions, some of the litters died of cold before supplementary heating was introduced, and an unequivocal result was not obtained. However, sufficient information was gained to advise farmers against the feeding of the grain to pregnant and lactating sows and an immediate result was the disappearance of the condition on those farms where this recommendation was adopted.

In order to provide incontroversial evidence of the correctness of the above belief the following experiment was planned and executed.

Methods for the Control of the Aspecific Type of Bovine Mastitis—*Concluded.*

GARNER, E. R., & BERRIDGE, N. J. (1952). *J. Dairy Res.* **19.** 31.

HOPKIRK, C. S. M., PALMER JONES, T., & WHITTLESTONE, W. G. (1943). *N.Z. J. Agric.* **66.** 30.

National Institute for Research in Dairying (1952). Dairy Eng. Dept. Test Report 52C/2.

——— (1955). Annual Report. Page 27.

NEAVE, F. K. (1957). Private communication.

PIER, A. C., SCHALM, O. W., HAGE, T. J. (1956). *J.A.V.M.A.* **129.** 347.

STUART, P. (1954). Unpublished. Quoted by Wilson, C. D. *Vet. Rec.* **66.** 780.

WATTS, P. S. (1951). *Ibid.* **63.** 32.

WHITTLESTONE, W. G. (1954). *J. Soc. Dairy Tech.* **7.** No. 2. 93.

WILSON, C. D., & SLAVIN, G. (1950). *J. comp. Path.* **60.** No. 3.

———. (1952). *Vet. Rec.* **64.** 425.

———. (1954). *Ibid.* **66.** 775.

———. (1958). *Ibid.* **70.** 159.

Material and Methods

Sows

Eight Large White sows were drawn from the herd held at the Veterinary Research Laboratory, Salisbury, for experimental purposes. These sows had been used, as gilts, in the previous experiment (*vide supra*) but prior to their inclusion in this latter experiment, each had produced and reared a normal litter.

Two groups were established with 4 in each group. The numbers were limited by the amount of available feed.

All the sows were run with a Landrace boar daily and a careful record kept of all services. All but one conceived to the first service. Sow 9 required 2 services.

Housing

In order to facilitate feeding arrangements the sows were housed in groups in deeply bedded cattle loose-boxes until 14 days prior to the estimated farrowing date when they were moved into portable thatched arks. These arks were provided with wooden floors and attached yards and had been successfully used to rear previous litters from the same sows.

Feeding

Each sow received 7 lb. of the composite experimental ration daily. In addition they received either sweet potatoes, pumpkin, kaffir-melons, green lucerne or green grass depending on what was available.

(*a*) *The grain-free component.* This was obtained from a commercial feed firm whose ration had apparently never been incriminated as causing any cases of the condition under investigation.

(*b*) *The ergot-infected millet.* Six 200-lb. bags of millet (munga) that were considered to have a relatively high percentage of ergot infestation, were obtained from Fort Victoria. These were bulked, thoroughly mixed by hand and representative samples collected. Aliquots of 25 g. from each of these samples were examined and the percentage ergot-infected grain determined as 0·67 on a weight basis.

The unmilled millet was mixed with the grain-free component at a rate of 2 to 1 by weight.

(*c*) *The ergot-free control feed.* Six bags of comparatively ergot-free grain was also obtained from Fort Victoria. This millet was treated so as to reduce the amount of grain infected with ergot to an indeterminable amount. This was accomplished by adding water to a third of a bucket of grain and, by hand agitation, keeping the grain in a state of suspension to permit the ergot-infected and lighter grains to float to the surface and be decanted. This was repeated 2 or 3 times so that all discernible grain parasitised by ergot was removed. The unmilled grain was mixed with the grain-free component at the same ratio as the ergot-infected millet.

The feeding of the experimental rations commenced approximately 30 days after the last service. As only a limited quantity was available, feeding of the ergot-infected millet was discontinued when all the piglets were dead. Feeding of the control ration ceased on the fifth day, *post partum*, when it was obvious that the piglets were in a good healthy state and obtaining plenty of milk.

All the millet used was from the 1956/57 crop.

Results

Ergot-infected Millet Group

Sows. From Table I it will be seen that all the sows in the group receiving the rations containing the ergot-infected millet showed no udder development at the time of parturition. The hypertrophy of the mammary glands normally expected during the latter weeks of pregnancy was completely absent. The photograph (Fig. 1) taken of Sow 11 on the day she farrowed shows the complete lack of development of the mammary glands in contrast to the photograph (Fig. 2) of Sow 9 showing the hypertrophy one would expect at farrowing.

With the exception of Sow 18, where some moisture was observed on the ends of the teats, no fluid could be expressed from the mammary glands.

Sows 2, 4, 11 and 18 which were fed for periods varying from 73 to 79 days prior to farrowing on the ergot-infected millet did not at any time exhibit signs of enlargement of the mammary glands. This was particularly well shown in Sows 4 and 9 which were served on the same day and where a difference in the size of the mammary glands was noticeable as early as the 19th day before the estimated farrowing date.

The average gestation period for the 4 sows was 111·7 days with a range of 109 to 114 days. The day of service was taken as 0 day.

The sows remained clinically healthy throughout the experiment and in particular no abnormalities

TABLE I

THE EFFECT OF FEEDING ERGOT-INFECTED AND ERGOT-FREE BULRUSH MILLET TO PREGNANT SOWS

Sow	Percentage ergot infected grain	Days fed prior to parturition	Gestation period	No. of piglets born		Average birth weight Lb. oz.	No. of piglets alive		Udder development	Milk production
				Alive	Dead		3 days	5 days		
2	0·67	79	112	12	Nil	1 12	Nil	Nil	None	None
4	0·67	73	109	8	6	—	Nil	Nil	None	None
11	0·67	78	114	8	Nil	2 6	Nil	Nil	None	None
18	0·67	79	112	7	2	1 15	Nil	Nil	None	Trace
6	Nil	80	114	9	Nil	3 5	9	9	Good	Plentiful
9	Nil	65	113	6	Nil	—	6	6	Good	Plentiful
14	Nil	80	115	10	Nil	2 12	10	10	Good	Plentiful
7	Nil	81	115	12	1	2 13	11	11	Good	Plentiful

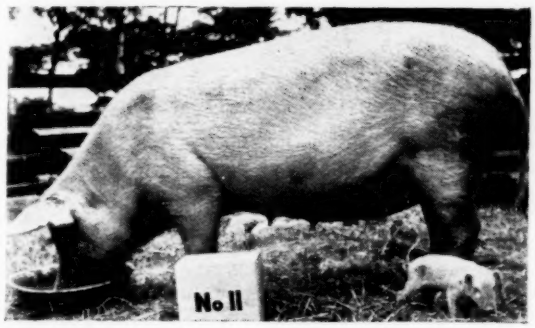

FIG. 1.—Photograph taken of Sow 11 on the day she farrowed after being fed on bulrush millet grain (*Pennisetum typhoides*) infected with ergot. Note the absence of any hypertrophy of the mammary glands.

FIG. 2.—Photograph taken of Sow 9 on the day she farrowed after being fed on bulrush millet grain free of any ergot. Note the normal hypertrophy of the mammary glands.

such as necrosis or gangrene of the extremities were noted.

The feed was taken with avidity at all times.

Feeding the ergot-infected millet was discontinued as soon as the last piglet died. In Sows 11 and 18 it was observed that on the third day of being fed a standard sow and weaner meal some development of the mammary glands had taken place and milk could be freely expressed from the teats.

Sow 18 in particular showed quite a marked enlargement of the udder.

Sows 2 and 4 were sacrificed and full *post-mortem* examinations undertaken. Sow 2 had been fed a standard sow and weaner ration for 2 days prior to being destroyed, and it was apparent that lactation had taken place as milk could be expressed from the mammary gland substance. Sow 4 was kept on the ergot-infected millet ration until destroyed, and no milk could be expressed from the mammary tissue. Apart from ascites (Sow 2—1,000 ml., Sow 4—750 ml.), hydrothorax (Sow 2—100 ml., Sow 4—70 ml.) and hydropericardium (Sow 2—40 ml., Sow 4—30 ml.) no lesions, and in particular of the extremities, were present.

Piglets. A total of 43 piglets were born in this group, an average of 11·75 per litter. Thirty-five were born alive and 8 dead ; 6 of the latter were from one litter. The average birth weight was 1 lb. 15·6 oz.

All the piglets born alive died within 72 hours of birth. The general impression gained was that the piglets lacked robustness, but all attempted to suckle.

The majority of the piglets died of starvation, but a number were crushed to death by the sow as they were too weak to crawl out of danger as normally active piglets would have done.

Post-mortem examinations carried out on the piglets showed a complete absence of milk in the stomachs.

Control Group of Sows

The 4 sows which comprised this group were fed on a ration containing millet free of ergot for periods of 65 to 81 days prior to farrowing.

Development of the mammary glands was normal and milk could be readily expressed by hand.

Feeding of the experimental ration was discontinued 5 days after farrowing as only limited quantities were available. By the end of the fifth day only 1 of the piglets born alive had died and it was obvious that the piglets were obtaining adequate quantities of milk.

The gestation periods varied from 113 to 115 with an average of 114·3 days.

The average birth weight of the piglets of 3 litters was 2 lb. 13 oz.

Thirty-seven piglets were born alive and 1 dead.

Further Experimental Work

Sow 15 was fed on a ration with a far higher percentage of ergot infected grain than that in the ration of the previous experiment. The millet used was that which had been recovered by flotation during the process of freeing the control feed of the previous experiment form ergot-infected grain.

The experimental ration was fed for 13 days before the sow farrowed down. The percentage ergot-infected grain in the ration fed for the first 5 days was 1·17 and for the subsequent 8 days 2·67. Feeding of this ration was continued until 3 days after farrowing.

The slight udder development which was present when the experiment commenced appeared to recede and when the sow farrowed, there was no hypertrophy of the mammary glands, and all the piglets died within 72 hours. *Post-mortem* examination of the dead piglets showed the complete absence of milk in the stomachs.

The 16 piglets were all born alive ; 7 died within 24 hours ; 3 within 48 hours and the remainder within 72 hours of birth.

The average birth weight was 2 lb. 4 oz.

The length of the gestation period was 111 days.

Discussion

The results of the experiments clearly demonstrate that the feeding of ergot-infected millet to pregnant sows completely inhibits the hypertrophy of the mammary glands normally seen in the later weeks of pregnancy and at parturition. It is obvious that the absence of hypertrophy of the mammae resulted in complete agalactia of the sows with the consequent death of the piglets from starvation.

While the condition was produced in 4 sows by

feeding 0·67 per cent. ergot-infected grain for 73, 78, 79 and 79 days respectively prior to parturition, the same effect was obtained in one sow which was fed for only 13 days on ergot-infected millet, though in this case the grain was much more heavily parasitised. The fact that lactation was demonstrable within 48 hours after the cessation of the feeding of ergot-infected grain, indicates the rapidity with which the aetiological agent is destroyed or excreted. This would suggest that there is no cumulative effect and that the condition could be produced by feeding the 0·67 per cent. ergot-infected grain over the period 2 to 3 weeks *pre-partum* during which hypertrophy of the mammae takes place.

Comparison of the average gestation periods of the 2 groups of sows shows that, that of the group being fed on the ergot-infected millet was 2·6 days shorter than the control group. The numbers involved are small but, taken in conjunction with previous experience with this condition it is in our opinion significant.

Over the 5-year period during which the condition described has been encountered, no cases of lameness, necrosis or gangrene of the extremities, as associated with chronic ergot poisoning, have occurred, although it is known that up to 1·2 per cent. of the grain may be parasitised by ergot. A possible explanation for the discrepancy is that the alkaloids of the ergot of munga differ from those of ergot of rye. This is supported by a report on the examination of 2 samples of ergot from munga by the Wellcome Research Laboratory, Beckenham, England ; who considered that it was quite apparent that the alkaloids from this ergot were a group of water soluble alkaloids and quite distinct from the ergotoxine/ergotamine group and the ergometrine group of alkaloids normally found in ergot. They also cite the work of A. Stoll *et al.* (1954) who isolated the new water-soluble alkaloids penniclavine, agroclavine and clymoclavine from a saprophytic culture of ergot fungus parasitic on African *Pennisetum typhoides*.

Any effect on piglets of the affected sows, other than starvation, as evidenced by death, is extremely difficult to assess, for while the general impression gained was that the piglets lacked robustness, it is not possible to accept the apparently confirmatory evidence of the low birth weights without criticism. While the piglets of the affected sows did not at any time before being weighed obtain a feed it was not possible to ensure this with the piglets of the control sows. This factor may also have led to a false impression being gained of the lack of robustness of the piglets of the affected sows as the condition of these piglets was steadily deteriorating while that of the control group was constantly improving.

While the experiments detailed in this paper were in progress access was obtained to a report of a similar condition in sows in the State of Montana, United States of America (Nordskog & Clark, 1945). These workers established, by means of feeding experiments, that the agent responsible was the ergot parasitising the barley in that area. The absence of hypertrophy of the mammary glands in the *pre-partum* period was recorded as well as shortened gestation periods, small weak piglets and a high proportion of still births.

Acknowledgments.—Dr. D. A. Lawrence, Director of Veterinary Services, is thanked for permission to publish this article.

We also wish to express our appreciation to Messrs. F. J. A. Waller and A. Cradock for their care and attention of the experimental animals as well as to the Division of Botany and Plant Pathology who undertook the estimations of the ergot content of the grain.

We also wish to express our thanks to the Grain Marketing Board of Southern Rhodesia for making available the *Pennisetum typhoides* grain for these experiments.

References

HESKETH, H. K. (1953). Unpublished report.
LAWRENCE, D. A., & ROSS, J. (1954). Personal communication.
NORDSKOG, A. W., & CLARK, R. T. (1945). *Am. J. Vet. Res.* **6.** 107–16.
ROSS, J. (1954). Unpublished report.
STOLL, A., *et al.* (1954). *Helv. chem. acta.* **37.** 1815.

RABBIT CLEARANCE

Opening the Conference of Rabbit Clearance Societies convened by the Agricultural Central Co-operative Association in London on February 5th, Lord Waldegrave said : " This conference is an important land-mark in the history of rabbit clearance in this country, because it is the first occasion on which representatives of groups of farmers, organised against the return of the rabbit menace, have come together to discuss the best ways and means of achieving this highly important objective on a national basis.

" Just before I came to this meeting, I was told that the number of societies in England and Wales has now reached the 100 mark. Eighty-three of these societies are in England and 17 in Wales, covering a total of over one and a half million acres. The Minister and I are watching the progress of rabbit clearance societies with very considerable interest, because we are very concerned at the situation with which we are likely to be faced.

" I know that in some areas where myxomatosis still persists, there is a tendency to rely on the disease to keep the rabbits down. I have no doubt that myxomatosis is killing rabbits in some parts of the country and that predators—stoats, weasels, foxes—are also lending a hand. Where this is happening they are allies of the farmer in his struggle against the rabbits. But you cannot win a campaign with allies alone. You have got to do something yourself. Moreover, my scientific advisers have been into this really thoroughly. They assure me that as time goes on more and more rabbits will get over the disease. They will build up a resistance to it. In South America, where the disease started, it's only in a mild form now. In Australia, where at first it killed over 99 per cent. of the rabbits which were infected, less virulent strains have already appeared."

An Outbreak of Helminthiasis Associated with *Hyostrongylus rubidus*

BY

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AND

J. G. GORDON

Blairgowrie

THE pig stomach worm *Hyostrongylus rubidus* is recorded as being common in the south of England but has not been recorded in Scotland (Lapage, 1956). The purpose of this communication is to record an outbreak of parasitic gastritis in breeding sows associated with this worm. The disease occurred on a farm in Perthshire.

History and Symptoms

The breeding stock consisted of some 30 sows and 3 boars and all the animals with the exception of 2 boars had been bred on the premises. Fifteen sows and 1 boar were clinically affected, being in extremely poor condition and showing marked inappetence. No deaths had occurred and the animals, although emaciated, were still active. Diarrhoea had not been a feature of the disease and in fact the faeces, which were very dark in colour, were abnormally dry and hard.

Management

The breeding sows and boars had been running in a paddock which gave access to a potato silage pit and also for a time to a catch crop of turnips. In addition to the potato silage the pigs were given 4 to 6 lb. per day of a meal of poor quality which was found on analysis to contain 10.2 per cent. protein, 1.6 per cent. oil, 5.4 per cent. fibre, 68.7 per cent. nitrogen-free extract, 4.5 per cent. mineral matter, 9.6 per cent. moisture. Six weeks before farrowing the sows were transferred to the farrowing house and the meal was then given in greater quantity.

One of the sows, a 3-year-old animal, was destroyed and examined *post mortem*. The carcase was emaciated and anaemic with lesions confined to the stomach.

Lesions

An uneven yellowish diphtheritic membrane covered the greater part of the gastric mucosa and the red worms 5 to 10 mm. in length were readily visible in great numbers throughout the membrane and in the underlying mucosa. The mucosa itself was thickened but showed little evidence of acute inflammatory reaction. A zone of gelatinous oedema was present beneath the mucosa varying in thickness to 1.5 cm. The intestinal tract was examined for parasites with negative results. The worm egg count showed 1,200 eggs per gramme faeces. The worms were identified as *Hyostrongylus rubidus* and this was confirmed by Dr. Silverman of the Moredun Institute.

Treatment

Examination of faeces from the animals in the herd showed worm egg counts of 300 to 700 eggs per g. Carbon bisulphide administered by stomach tube gives satisfactory results according to Monnig, but in order to avoid the inconvenience of this method of treatment it was decided to try phenothiazine and piperazine. Three sows were each treated with 20 g. of phenothiazine and 3 with 20 g. of piperazine by the addition of the drugs to the feeding; however, the sows offered phenothiazine refused the meal and had to be drenched with a suspension of the drug in water. Phenothiazine has been recommended by the British Veterinary Association and it was decided to try this although it has been found to be unsuccessful by many members (1942-6). In order to avoid re-infestation pens were disinfected after treatment and the sows in the paddock were treated before being admitted to the farrowing house.

Examination of faeces taken a week after treatment showed no worm eggs at all in the 6 treated cases and similar results were obtained after an interval of one month. These results and the improvement in condition would suggest that the worms had been eliminated and that the failure to demonstrate eggs in the faeces was not merely the result of suppression of egg production.

White fish meal was added to the original sow meal to give a protein level of 20 per cent. and this improved meal was fed for a few days before the animals were given anthelmintic treatment. In spite of this alteration to the meal the sows continued to show inappetence till after treatment when a marked improvement in appetite was noted.

References

B.V.A. Publication No. 14. "The Husbandry and Diseases of Pigs." P. 92.

EDWARDS, J. TWEEDALE (1947). Imperial Agriculture Bureau Joint Publication No. 12. P. 17.

LAPAGE, G. (1956). Veterinary Parasitology. Pp. 57-9.

MONNIG, H. O. (1950). 3rd Edition Veterinary Helminthology and Entomology. P. 208.

SYMPOSIUM

Some Professional Prospects for the Student

IN last week's account of the 9th annual conference of the Association of Veterinary Students the hope was expressed that we should be able to publish a report on the symposium contributed by four senior members of the profession. We are indebted to an hon. officer of the Association for the following abridged account.

The Veterinary Surgeon in Colonial Service

BY

R. S. MARSHALL

Mr. Marshall began by explaining what was meant by Colonial service. He received many enquiries about veterinary service in the Commonwealth countries, but Colonial service applied to those who served in the Overseas Service Division, Veterinary Service of Her Majesty's Civil Service. There were, at present, some 335 veterinary surgeons on this list, and the observations Mr. Marshall intended to make applied to this section of the overseas service only. Of the number mentioned about 270 qualified from the United Kingdom. There were, in addition to these surgeons, a number of private practitioners so the field was competitive.

The number of members had suffered no decline with the independence of some overseas territories since the number of appointments elsewhere had increased, particularly in Kenya. However, response to recruitment had not been as good as was hoped, even though the profession was in a phase of relative prosperity. Because of this failure of United Kingdom recruits the Division had filled its ranks with graduates from other countries, both foreign and Commonwealth. It had even been necessary to cancel some vacancies. Over the past 3 years the monthly vacancy figure had remained at between 25 and 30. Directors were becoming impatient at the poor recruitment, and it was not at all satisfactory in Mr. Marshall's view.

He then went on to examine the reasons for this state of affairs. Salaries were under constant review so that they should not appear unattractive by comparison with other branches of the profession. Housing appeared to be a factor and educational facilities for members' children was another. Some veterinarians felt that local amenities were not comparable to those at home. It was the Division's duty to attempt to improve these conditions; but the main stumbling-block was the likelihood of political and economic change. If world prices of raw products fell the wealth of the Colonial territories also fell. This would result in the disappearance of vacancies and a lowering of the members' status. There were signs of this already, though it was difficult to see if the recession were temporary or permanent. However, there was still a demand for veterinary officers in the departmental field service, research officers, special field investigation officers, and public health officers. All these posts were generally under Governmental control. There was also an increasing demand for private practitioners and for workers in industrial firms.

Thus, while the position still appeared satisfactory, what of the future? Although satisfactory from the students' point of view, it was not from that of Mr. Marshall. There was one big worry—the replacement of United Kingdom veterinary surgeons by local practitioners. The picture varied greatly throughout the territories served by the Division. The West Indies and Malaya were almost self-sufficient, whereas Ghana had not yet a single native veterinary surgeon. It was obivous that replacement would continue, but it would be some time yet before it was complete. This could be seen from the number of local men attending veterinary schools. For example, two schools, in Kenya and Northern Nigeria, would have no graduates for another 6 years, and thus permancy of posts could be assumed for about 20 to 25 years.

Most posts were taken on 3-year tours. It had been suggested that these tours should be increased, even up to 10 years, with a lump sum gratuity at the end. This applied particularly to field veterinary officers. The future of research workers was also well provided for. Modern research laboratories were being set up in East, West, and Central Africa; there was still much work to be done in the field of tropical medicine. These posts were associated with the Colonial Research Service, the salaries being in line with the Service at home. The majority of private practitioners in the Colonial territories had graduated from Government service. With livestock improvement there was arising a demand for an individual, not a herd, outlook, and hence the emergence of the private member. This was another trend likely to continue, as owing to a rapidly growing human population there was an increased demand for food and with it the services of veterinary surgeons.

Mr. Marshall believed generally that things were moving along the right lines, but it was up to the student of to-day to decide whether this was to continue.

The Veterinary Surgeon in General Practice

BY

L. GUY ANDERSON

Mr. Anderson said that the general practitioner was the backbone of the profession. Of the students listening to him many would be going into general practice, though not everyone was suitable for this branch of the profession. There were a number of qualities needed in a successful practitioner. In country practice it was obvious that physical fitness was essential (especially for an assistant). The practitioner must be able to get on with people. He must

be able to inspire confidence and work well with his fellow members in the profession. He must also have some administrative ability, and this was becoming increasingly important.

There were a number of disadvantages in general practice which should not be overlooked. These included long and irregular hours, and consequent disruption of home life. There was a general sense of lack of security with little provision for times of illness or any pension at the end of one's working life. Obviously some of these worries were not borne by assistants, who had holidays with pay—the principal did not!

At the present time it was more difficult than ever to establish oneself in practice. For one thing violent inflation had made it difficult to get the necessary capital; those members who were established before the war were very fortunate. More money had to go in insurance and income tax. Yet despite all these disabilities the veterinary surgeon remained one of the very few independent members of the community. It was comforting to think of oneself as one's own boss, even when, in fact, one was really everybody else's servant.

Life in general practice was a happy one. There was a constant variety of work, never knowing what was coming next. It was possible to build up a position in the local community, and the circles one moved in could be very enjoyable. The profession was at present in a state of prosperity, and the newly qualified graduate was able to name his own terms as he entered the ranks. He should remember, however, that a practice was essentially a "family" affair where there was no room for ill-will or bad feeling. Mutual trust was vital, and a principal came to expect much from his assistant.

In general practice the beginner usually earned £800 to £900 per annum, with quite rapid increments, and in addition he received as an assistant allowances in the shape of a house, use of car, and use of telephone. These were becoming accepted additions to the basic salary. In the immediate future, because agriculture had become more and more efficient and could afford fewer losses, the veterinary surgeon was becoming an increasingly important person. The new and continual changes in farming methods demand a great many well-trained veterinary surgeons, and there seemed to be ample demand at present for the services of the profession.

The Veterinary Surgeon in Teaching

BY

F. R. BELL

Dr. Bell considered it was of interest to the student to learn something of the life of those members of the profession with whom he was most in contact. A teacher was not only occupied during the three ten-week terms. Research occupied a great deal of his non-teaching time. The stipend offered security, partly due to the aquisition of the veterinary schools by the universities. Thus salaries of veterinary teachers were in line with those of other university teachers. The salary of an assistant lecturer compared reasonably with that of a young general practitioner, starting off at about £700 per annum with increments and the advantage of security. A teacher could expect to lead a reasonably comfortable life, and in his forties might expect to earn about £2,000 a year.

In Dr. Bell's view it would be advantageous for the welfare of the profession if teachers had a knowledge of all subjects at all levels, but this was not possible. Generally, a teacher could enter at any level, even as a professor without previous teaching experience. It was to a teacher's benefit if he had practical experience.

The individual must be capable of getting on with people and coping with the exuberance of youth. He must also have the ability to get on with his colleagues, and must be impelled to take up this branch of the profession because of a vocational urge. His career would give him an opportunity to indulge his curiosity in his research studies, and the attraction of working in a teaching establishment such as the Royal Veterinary College was that one had good facilities to pursue one's researches, and could, when necessary, consult with other members of the university.

The hours of work were more regular than those of a general practitioner though this was determined by the work being undertaken: some experiments required long hours. The teacher would never earn large sums of money, but security for himself and his dependents was assured.

The Veterinary Surgeon in National Research

BY

A. W. STABLEFORTH

The future for the research worker, Dr. Stableforth said, was good. An enormous amount of work had still to be done. This was an admirable branch of the profession, because if the student felt inclined towards it he would be doing great work.

Research was both absorbing and had the thrill of discovery—the joy of unfolding, piece by piece, some mystery.

There were various aspects of research, the first being to consider where it was carried out. To name but a few places there were the Pirbright Institute, the Animal Health Trust, establishments like Weybridge, and other veterinary investigation centres, teaching colleges, and commercial laboratories. Research took on a variety of forms, fundamental and basic to name but two. Fundamental research might be of academic or of practical interest, and basic research was vitally necessary to help solve the problems in hand.

Many topics might be under consideration in one establishment. At Weybridge there were units concerned in virology, respiratory disease in poultry, immunology, neuropathology in pigs, cobalt utilisation, and many other fields of investigation.

The research worker usually came direct from college, or after obtaining a post-graduate degree. He might go either to a small or a large institute. In the case of the former he would be in a closely

(Concluded at foot of col. 1 overleaf)

Some Historic "Cures"

BY
GEORGE TREMLETT

THE following article is based upon a hand-written volume of 18th century "recipes" given to my grandfather, the late William Kendrick, a veterinary surgeon. One of the farmers in his Cheshire practice found the book tucked away among others on his shelves, and gave it to my grandfather. Hand-bound in leather, the book contains some 150 pages of "cures" for various animal complaints, and is written in spidery long-hand. From the few dates, it appears that the recipes were collated in 1787 from a number of sources. Some are attributed to "my lordship's groom," many to "Matt Rain," and a large number to people whom the author met on his travels.

In a description of what the author calls the "downfal," we are told that in those days a standard treatment for milk fever was bleeding, though the writer believed this was used too frequently. His recipe was to boil 8 ounces of Epsom salts in 3 pints of water gruel, and mix this with 2 ounces of powdered crude salammoniac, 3 ounces of cream of tartar and 1 ounce of black sulphur. He writes: "This dose is sufficient for a large, strong cow, but to a small, weak one rather less may be given. Let her have plenty of cold water to go to, but if she cannot get up, let a pailfull be set by her to drink when she pleases. Let her not be exposed to the hot, burning sun nor to heavy showers of rain.

"Let her paps be gently stroked, but not squeezed so much as to force from them a thin red serum, which would, perhaps, bring on an inflammation."

Another treatment is for "beasts that have swelled bodies," which, the author says, sometimes happens when they are first turned out to grass in the spring, or when they feed upon clover or turnips. His medicine for this is made by mixing 8 ounces of Glauber's salts with half a pound of palm oil, and 4 ounces of mustard seed in a quart of gruel.

"If the swelling does not subside in about half an hour let the medicine be repeated. If, after all, the beast still appears to be in great danger, the following remedy, which some, perhaps, will think a desperate one, may be used. Take a lancet or sharp pen-knife and prick the beast on the left side, 3 inches below the short rib in the mid-way between the hip and the long rib, in order to let out the wind, and afterwards lay on a pitch plaster to exclude the external air. Some people have a notion that driving them hastily about for a considerable time might be of service, but I think it would rather tend to injure than relieve them."

Here are two treatments for horses. The first is to cure a horse with a "running nose." An ounce of mustard seed should be mixed with one of alum in water, and the mixture squirted up the horse's nostrils. The other is for a horse with a canker of the mouth or tongue. "Take one ounce of alum and boil in one pint of water until reduced to two-thirds of quantity, then add 2 ounces of simple tincteuse of myrrh. To dress the part tie a little linen upon the end of a stick and rub the part well. Dip in the above mixture, and dress it every day while well."

Equally simple (and presumably equally efficacious) is a remedy for a disease of swine, though the symptoms of the disease are not given. The medicine is a mixture of equal quantities of salt, gunpowder, brimstone, and soot to be taken a spoonful at a time in water. Just as rigorous is a recipe for rat-poison—six pennyworth of aniseed oil, eight pennyworth of oil of rodium, and two pennyworth of arsenic, to be mixed with fine wheat flour and as much rum as is needed to make it into a stiff paste.

Veterinary surgeons who may find use for a preparation to be used in cleansing cows may (or may not) wish to try the following: 2 ounces of spermiciti, 2 ounces of juniper berries, one ounce of myrrh, one ounce of aniseed, and 2 drams of saffron. The mixture is prescribed as a drench to be taken, 2 days after calving, in a quart of warm ale.

Ale occupied as important a place in the farmer's medical chest as it did in his cellar. Among the many complaints which are said to have been treated with mixtures in an ale drench are colic, colds, wind, and stone in the bladder.

Matt Rain had an ale recipe for drying a cow. "Take three pennyworth of diors' madder," he

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Symposium—*Concluded.*

compact unit; in the latter, in a group within a group, in close contact with colleagues pursuing different fields of investigation. In either case he soon became part of a team, gradually settling down to attack the problem in hand. Later he might be sent away for further training, perhaps abroad or to attend congresses, all of which would increase his value to himself and his department.

The research worker's initial salary was about £800 to £900 a year. His progress varied; he might gain promotion either on his ability to lead a team and organise the findings, or purely on his own research work. He might then earn about £2,000. Advancement depended much on merit. He might later become head of a department, when his salary would be comparable with that of a professor.

The qualities needed were difficult to enumerate. Research was not only an art, it required great application. The worker needed the tenacity of purpose of Pasteur, and the doggedness of Darwin. It was easy to acquire facts; it was far more difficult to use them. If a student believed he had some of these attributes then he should attempt some research; he would find it both satisfying and an abiding pleasure.

wrote, " and three pennyworth of argil, powder them both very fine, and give them to the cow in one quart of good, warm ale, and never milk the cow afterwards; put her on to the best meal you have and she will very soon be dry." He adds a footnote: " The above has been tried and proved. *N.B.* Blood the cow well when you give this drink and again ten days afterwards."

Some of the recipes are recondite indeed, and that for foals having " infection of the navel " takes some beating. The esoteric practitioner suggests as follows: " Take one handfull of pigeon's dung, one head of garlick, half an ounce of dissolved aloes (a plant-juice used as a purgative), one pennyworth of sulphurack, two pennyworth of gunpowder, two pennyworth of powdered snakeroot, and two pennyworth of powdered wormwood. Boil the pigeon's dung in a quart of milk and then stream it off and add to the above ingredients."

Three different ointments for sores on horses' heels are given. In the first, equal quantities of hog's lard, honey, alum, vitriol, common turpentine, and boalormorish (whatever that may be) are to be stirred together and heated slowly. The dressing is applied with the fingers, after cutting away the hair from around the sore.

Hog's lard is also needed for the second treatment. Four ounces should be pounded with 4 ounces of oil of turpentine, 2 ounces of vitriol, and 2 ounces of alum. After pounding into a fine powder (which seems to be hardly possible with a greasy substance), it should be mixed with 2 ounces of verdigris and 4 ounces of honey while slowly heating.

The third dressing is made by boiling a pound of yeast, half an ounce of verdigris, and half an ounce of honey over a slow fire until the brew turns to a " middling-brown colour," which should, according to the book, take about an hour. A warning is given that unless a large pot is used, the mixture will swell so much that it will rise out of the container.

Two " cures " are given for curing a broken winded horse. The first is to boil some herbal blossoms (the author calls them " Whins ") in stale ale, and add one ounce of juniper oil to every half pint of the liquid. " The horse should have half a pint of the above liquor before he goes to work."

The second recipe (said to be infallible) is admitted to have been copied from a newspaper cutting. " Put a shovel-full of quicklime into a pail filled with water, and give this to the horse every day for a month. A shovel-full of lime will serve for 5 or 6 days, by adding fresh water to it."

A hot iron features in the treatment of fistula in a horse or a bull. " Take one ounce of butter of antimony and put it into a strong bottle, and take one ounce of balsam drops and drop them into your antimony drop by drop or else it will break your bottle. Then make holes in the fistula with a hot iron, and drop the ingredients into the holes."

Before my grandfather died he made enquiries about the use of these remedies and found that some of them (unfortunately he left no record of which) were still in use. He heard of one farmer who " cured " a blown cow by puncturing its belly with a pen-knife.

Current Literature

BOOK REVIEWS

The World's Best Horse. By LADY WENTWORTH. George Allen & Unwin Ltd., London. 50s.

All men of any merit cast their eye with pleasure upon a good horse, for in form, grace and spirit he is the king of all the domesticated animals.

Through all known history horses have been the loyal servants and friends of man, at work, and at play, and it can be said with truth that the dawn of civilisation was coincident in time with the descent of man from the trees and his ascent upon a horse's back.

In spite of all the marvels of scientific discovery which bear upon a bewildered modern world, probably the two factors which have exerted most influence on the advance of man from primeval state are the domestication of the horse and the invention of the wheel.

The title of this book is a little misleading. One would expect a book on the world's best horse to be about some particular animal or even breed but what do we find within its pages ? It is about horses, all sorts and breeds of horses that have devolved from the 3 main rootstocks, the northern cold-blooded, the southern hot-blooded and the intermediate cool-blooded types. The author dissertates on the history and origin of the horse and whilst giving full credence to such things as rock drawings and the ancient sculptor's art, it is easy to see that she casts a sceptical eye upon the speculations of those who attempt to portray the shape and form of an animal who lived 5,000 years ago and base their assumptions and orientate the design around and upon a fossilised tooth. The recent disclosure of the great Piltdown hoax which caused the most erudite anthropologists to accept a monkey's mandible, of quite recent date, as authentic evidence upon which to plot the design and progress of man, lends good support to some of her doubts and suspicions.

The author's historical review of the origin of the horse is based on broad principles and facts and not on a dreamer's conjecture. The illustrations in this section show that the artists of ancient times had an eye for a good horse whose form and shape would be acceptable according to present day standards.

Chapter II deals with the great horse of Europe, the one the Knights and Crusaders used and from which the draught horses and carriage horses, for which this country is famed, have evolved. From Caesar to Henry VIII light horse breeding is purely of academic interest owing to the elimination of light stock and their replacement by ponderous weight carriers. The need for strong heavy horses was so insistent that as early as A.D. 1200 King John and later Richard II imported " Great Horse of Europe stallions " to strengthen the native breeds. Henry VIII went further than this and ordered all horses under 15 hands to be destroyed.

The " Thoroughbred " and racing horse is reviewed and it is interesting to note that light horses and

racing horses were in favour in the Middle East many hundreds of years ago, and there is evidence in the Hittite treatise of Kikkoulis of detailed instructions for training, sweating and feeding racehorses as long ago as 2000 B.C. The author naturally has a soft spot for Arabian horses, and their influence on the development of the British Thoroughbred is reviewed. The Thoroughbred is entirely foreign and developed from imported stock. In this respect it is evident that we owe a great debt to King James I, King Charles II and Cromwell. Breeding, the value of blood, Bruce Lowe's theories and the ideas of J. B. Robertson are reviewed. Lady Wentworth is an undoubted authority on breeding and her great horses did not come by luck but by judgment. Her criticisms of others are logical and not destructive ; her own views are intriguing and command respect.

It is interesting to note that the American horse, Hanover, won 12 races after being unnerved. That the first Jockey Club was founded in America at Charlestown in 1734. The great Zev, who won more than any other horse, was from the stud of John E. Madden of Lexington, Kentucky, who was at the head of winning breeders for 11 years, 1917–28, and bred the winners of 4,130 races. Madden stated that he had no principles of line breeding, or any mathematical theories or theories of crossing for speed or stamina, his sole principle being " Breed a good horse to a good mare." The author states that this is her view also.

After the chapter on racing, the horses of many countries are described and their various qualities are discussed. These chapters make most interesting reading. It becomes evident that the horse is a most adaptable animal and he can conform to any environment. It is evident also that in form and shape a good horse conforms basically to a certain pattern wherever he may live. Hunters, Hackneys, Trotters all come under review. The author gives much attention to the Pony breeds. It is known that Lady Wentworth did not accept *in toto* the views of those who support the pure bred native pony ideas and she does not spare her punches. She does give her readers much valuable information on the origin and history of the various " improved " pony breeds and the standards by which their quality is assessed. There can be no doubt that she has a " soft spot " for the Welsh Pony. It, more than any other, approaches the quality, grace and beauty and stamina of the Arab, and what better standard could there be for the breed of ponies that gave us " Starlight."

The final chapter is devoted to Arabian Racing Foundation Breed, the origin of speed, the points of the Arab and Anglo Arabs.

This book is a masterpiece in text and illustration and it is mounted in a frame which is a tribute to its contents and to the publisher's art. It is a book to which no review can do full justice for it is almost an encyclopaedia devoted to horses. One can turn to it time after time and find something of interest on every page. I only regret that there is no index to ease a student's search for knowledge.

Newsom's Sheep Diseases. By HADLEIGH MARSH. 2nd Edn., xiv + 406. Illustrated. Baillière, Tindall & Cox Ltd., London. 72s.

According to the preface, this book is intended partly for the use of sheep producers but, in the reviewer's opinion, it is more suitable for practising veterinary surgeons and veterinary students. This is not a criticism of the book, since so many previous books on sheep diseases have fallen between 2 stools by attempting to combine writing suitable for a veterinary surgeon with that directed to the farmers.

Throughout the book, an attempt has obviously been made to present a fair review of knowledge available on the subject under discussion and firm conclusions have only been drawn where this appeared to be justified. Unsupported personal opinions are not included. The lists of references are not comprehensive but they appear to be accurate and are sufficient for this type of book.

Diseases are considered under the headings : " Infectious Diseases," " Parasitic Diseases," " Nontransmissible Diseases " and " Poisons." Under " Infectious Diseases " most of the conditions described occur in Great Britain and the discussion is adequate for this type of book. A few bacteria are referred to by names which might puzzle the British reader, *e.g. C. novyi* for *Cl. oedematiens*, *G. perfringens* for *Cl. welchii*, *Spherophorus necrophorus* for *F. necrophorus*.

External parasites, flukes and tapeworms are dealt with adequately but the section on nematodes is disappointing. The section on general control of nematodes could with advantage be extended, and there are excellent books devoted to parasitology which make inclusion of detailed descriptions of each worm largely unnecessary. In many cases, the legends under the illustration of this section read " right " when they should read " left.

The section on nontransmissible diseases is well written and the author avoids giving facile advice. The point is made that " sheep are outdoor animals and weather is something that cannot be effectively controlled."

Inorganic and organic poisons are well discussed but it is possible that the section on poisonous plants will be of little interest to most British readers.

Printing and binding are good and the index is above average. It is a book which should be available to every veterinary surgeon who is concerned with sheep.

BOOKS RECEIVED

Lecture Outline of Preventive Veterinary Medicine for Animal Science Students. By I. A. SCHIPPER. Mayflower Publishing Co., Ltd., London. 18s.

Lehrbuch der Rinderbesamung. By Dr. KARL EIBL. Verlag Paul Parey, Berlin and Hamburg, D.M. 74.

Lehrbuch der Vergleichen Anatomie der Haustiere : Band III. By Professor Dr. J. DOBBERSTEIN and Professor Dr. T. KOCH. S. Hirzel, Verlag, Leipzig. D.M. 15.50.

Ecological Processes. By ALAN MOZLEY. H. K. Lewis & Co., Ltd., London. 9s.

R.C.V.S. Council Elections

We publish below brief biographical details of those gentlemen who are offering themselves for election

Dr. F. R. Bell was born in 1914 and was educated at Gateshead Grammar School, Armstrong College in the University of Durham and at the Royal Veterinary College. He was awarded B.Sc. (Hons. Zoology) in 1936, M.R.C.V.S. in 1940, Ph.D. (London) in 1950, and F.R.C.V.S. in 1957.

From 1940-5 he served in the Colonial Veterinary Service being posted to the Uganda Protectorate; from 1945-7 he worked as a member of the staff of the Wellcome Veterinary Research Station at Frant. He was then appointed Lecturer and subsequently Senior Lecturer in Veterinary Physiology at the Royal Veterinary College.

He has been President of the Central Veterinary Society and represents this Division on the Council of the B.V.A. He has also served the B.V.A. on the following committees: Parliamentary and Public Relations, General Purposes and Finance, Overseas, and Editorial.

Professor T. J. Bosworth, President of the Royal College for 1958-59, was born in 1893 and qualified in 1915. Having served with distinction in the first World War, when he was mentioned in despatches, he became Research Assistant to Sir John M'Fadyean from 1920-23, and then succeeded the late Professor Buxton as Veterinary Superintendent of the Wellcome Physiological Research Laboratories. He was next appointed as Assistant Director of the Institute of Animal Pathology at Cambridge, where he remained until 1939. In that year he was appointed Professor of Pathology and Director of the Research Institute in Animal Pathology at the Royal Veterinary College, becoming a Professor within the University of London when the College was incorporated as a School of that University. Professor Bosworth has been a member of the Council of the R.C.V.S. since 1944 and was a member of the Council of the B.V.A. from 1944-53. He is a past President of the Section of Comparative Medicine, Royal Society of Medicine, and is a member of the Editorial Board of the *Journal of Comparative Pathology and Therapeutics.*

Mr. Harry Holroyd, was born in Blackburn in 1914. He was educated at Ashville College, Harrogate, and at the School of Veterinary Medicine, Liverpool University, qualifying in 1936. He entered the family practice at Blackburn, which was started by his grandfather in 1883 and carried on by his father. Mr. Holroyd was elected to the Council of the National Veterinary Benevolent and Mutual Defence Society some 12 years ago, and has been Vice-president since 1954. He was elected to the Council of the R.C.V.S. in 1950 and has served continuously since. He has been a member of the Council of the B.V.A. for a number of years, and was President of the Lancashire Division in 1957.

Professor H. G. Lamont, O.B.E., qualified in 1923. For some 9 months after qualifying he worked as an unpaid assistant to the late Professors Craig and Kehoe. In March, 1924, he was appointed to the Imperial Secretary's laboratory in the Queen's University, Belfast, and within a few months was made demonstrator in the Department of Pathology, Faculty of Medicine. He obtained his B.Sc. in 1926, M.Sc., in 1928, and his Doctorate of Science in 1940.

In 1930 he was appointed by the Senate of Queen's University to a lectureship in Dairy Bacteriology, and in 1931 became Director of the Veterinary Research Division of the Ministry of Agriculture for Northern Ireland. His services to veterinary science in Northern Ireland through the Faculty of Agriculture resulted in the University creating a Department of Comparative Pathology and appointing him as Professor in 1951.

In the same year he was elected to the Council of the Royal College of Veterinary Surgeons, and in 1952 was appointed chairman of the Examination and Education Committee, a position which he has held from that date. He has been a member of the B.V.A. Council for many years.

In Northern Ireland, Professor Lamont has worked wholeheartedly with the practitioners and was elected President, for a second time, of the North of Ireland Division in 1955 when the B.V.A. Annual Congress was held in Belfast.

He has contributed much to the literature, his main contributions having been in pioneer work in pigs.

He was awarded the John Henry Steele Medal by the Royal College in 1955, and the Dalrymple-Champneys prize in 1957.

Mr. K. Cummings Sumner was educated at King Edward VII School, Lytham St. Annes and Glasgow Veterinary College. He qualified in December, 1947. After 12 months as an assistant in general practice he established his own practice in Bristol, specialising in small-animal work.

In 1949, in association with Campbell, Broom *et al.*, he investigated an outbreak of canicola fever in Bristol, and since then has been interested in various forms of clinical research including diseases of animals transmissible to man, canine coccidiosis, and the use of parenteral coagulants. He has had papers published on the majority of these subjects.

Mr. J. B. White was born in 1906 and is the son of a veterinary surgeon. His family's connexion with the profession goes back for many years. He graduated in 1927 at the Royal Veterinary College and first went as assistant in a Falmouth practice. In 1930 he became joint assistant to two practices in Salisbury and later became senior partner of the amalgamated practices. Mr. White, as a past President, has represented the Southern Counties Division of the B.V.A. on that body's Council for a number of years, and having served on several standing committees is now Chairman of the Technical Development Committee. He was elected to the Council of the Royal College in 1953 and has served on several committees, including the Disciplinary Committee. Though principally known as a practitioner specialising in large-animal practice, Mr. White is also an examiner for the University of London for the B. Vet. Med. degree.

Mr. Edward Wilkinson, who was born in 1902, graduated from the Royal Veterinary College in 1924. He became principal of his own practice in Leicestershire in 1927, and removed to Derby, where he has practised ever since, in 1933. Mr. Wilkinson became a member of the B.V.A. Council in 1943 and President in 1955. He has taken a prominent part in the life of his profession as President of the East Midlands Division of the B.V.A., the Midland Counties Division and the Society of Practising Veterinary Surgeons, whose President he now is for the second year in succession. In this capacity Mr. Wilkinson is closely concerned in the survey of the profession's economics which is being carried out at the present time by the Society of Practising Veterinary Surgeons, and which is expected to be of great importance to all members in private practice.

Mr. H. M. Wilson, is a native of Edinburgh, born May 7th, 1905, and educated at George Watson's College for Boys and the then Royal (Dick) Veterinary College. He qualified on May 7th, 1926, since when he has been in general (mostly agricultural) practice.

For many years he was a member of the Council of the Scottish Metropolitan Division, B.V.A., and for a time was that body's elected representative on Council B.V.A., where he served on standing committees. He is a member of Council of the Scottish Branch B.V.A. and of the National Veterinary Benevolent and Mutual Defence Society, and is also a member of committees and sub-committees advising the Secretary of State for Scotland. Mr. Wilson serves the Department of Agriculture for Scotland's panel for examining stallions, and is also a referee in respect of the licensing of bulls.

He is a serving member of Council, committees and sub-committees of the Royal College of Veterinary Surgeons.

Dr. W. R. Wooldridge qualified in London in 1924, was awarded the Mastership of Science in 1927 and the Ph.D. (Cantab.) in 1928. His first interest was in teaching and he was a member of the staff of the London School of Hygiene and Tropical Medicine, 1929 to 1946. In the latter year he became Scientific Director of the Animal Health Trust, which he founded and with which his name will always be associated. Dr. Wooldridge was President of the B.V.A., 1941-43 and President of the R.C.V.S., 1954-55, having been a member of Council since 1939. In 1937-39 and again in 1943-44 he was a member of the Loveday Committee on Veterinary Education. His close connexions with the University of London include his membership of the governing body of Birkbeck College since 1934, his membership of council of the Royal Veterinary College since 1943, and his membership of the Senate of the University since 1952. He has twice been Vice-president of the Parliamentary and Scientific Committee and its vice-chairman since 1957.

Mr. Michael Young was born on October 3rd, 1925. He commenced his studies at the Royal Veterinary College in September, 1941, and qualified in October, 1946. He became assistant to Mr. J. S. Blair of Winchmore Hill, until, in 1950, he purchased his present practice at Ealing. Mr. Young is senior Vice-president of the Central Veterinary Society, and a member of the Executive Committee of the British Small-animals Veterinary Association.

News and Comment

THE BRITISH SOCIETY OF ANIMAL PRODUCTION

The 30th meeting of the Society will be held at Friends House, Euston Road, London, N.W.1, on Wednesday and Thursday, February 25th and 26th, 1959. Most of the time will be occupied by a symposium (on the Wednesday) under the title "Recent Developments in Sheep Production," and by a series of papers on current research on the Thursday. Lunch will be provided each day for 50 people at a cost of 5s. 6d., and those wishing to have lunch at Friends House are asked to write to Mr. J. P. Maule, the secretary. The first 50 applicants will receive tickets and only ticket holders can be served.

THE GRASSLAND RESEARCH INSTITUTE

The Grassland Research Institute of Hurley, near Maidenhead, Berks., has just issued the following list of available publications:—

Alder, F. E., "The overwintering of young cattle." *Proc. Brit. Soc. Anim. Prod.* 1958, 53-64; Tayler, J. C., "Carcase quality studies in cattle: the measurement of conformation." *Proc. Brit. Soc. Anim. Prod.* 1958, 65-76; Spedding, C. R. W., Brown, T.H., and Wilson, I. A. N., "Observations on nematodirus spp. infestation in sheep." *Vet Rec.* 1958, **70,** 229-32; Alder, F. E., and Chambers, D. T., "Studies in calf management, 1.—Preliminary studies of post-weaning grazing." *J. Brit. Grassl. Soc.* 1958, **13,** 13-20; Langer, R. H. M., and Ryle, G. J. A. "Vegetative proliferations in herbage grasses." *J. Brit. Grassl. Soc.* 1958, **13,** 29-33; Norman, M. J. T., and Green, J. O., "The local influence of cattle dung and urine upon yield and botanical composition of permanent pasture." *J. Brit. Grassl. Soc.* 1958, **13,** 39-45; Cowlishaw, S. J., and Eyles, D. E. "The use of dried clover in the diet of laying hens." *Poult. Sci.* 1958, **37,** 960-6; Davies, William, "Grassland developments in the United Kingdom in the last 25 years." *Emp. J. exp. Agric.* 1958, **103,** 195-207; Grossbard, Erna, and Stranks, D. R., "Translocation studies in fungi by tracer techniques." *Abstract 8th Int. Con. Microbiol. Stockholm,* 1958; Davies, William, and Williams, T. E., "Fertilisers and grassland." *Paper read before the Meeting of the Fertiliser Society, Hurley,* May 29th, 1958; Eyles, D. E., and Davies, William, "Pastures for pigs." *Agriculture* 1958, **65,** 125-8; Williams, R. D., "Trace elements in grassland." *N.A.A.S. quart. Rev.* 1958,

No. 41, 19-24; Clement, C. R., and Williams, T. E., "An examination of the method of aggregate analysis by wet sieving in relation to the influence of diverse leys on arable soils." *J. Soil Sci.* 1958, **9,** 252-66; Grossbard, Erna, Minson, D. J., Davies, William, and Horne, T., "Preservation of grass for winter-feeding by radiation sterilisation. *Nature, Lond.* 1958, **182,** 321; Brown, T. H., and Spedding, C. R. W., "A study of husk in calves." *Brit. vet. J.* 1958, **114,** 296-307; Grossbard, Erna, "Auto-radiography of fungi through a layer of soil and in agar culture." *Nature, Lond.* 1958, **182,** 854-6; Langer, R. H. M., "A study of growth in swards of timothy and meadow fescue, 1.—Uninterrupted growth," *J. agric. Sci.* 1958, **51,** 347-52; Chambers, D. T., Alder, F. E., and Davies, William, "Pasture rearing of bucket-fed calves." *Agriculture, Lond.* 1958, **65,** 357-8.

THE ROYAL SOCIETY OF HEALTH

The Royal Society of Health announces that three of its Vice-Presidents have completed more than 50 years' membership of the Society. They are Lt.-Col. William Butler, Dr. Thomas Orr, and Lt.-Col. James A. Dixon.

Lt.-Col. Dixon, who is nearly 80 years of age, qualified as a veterinary surgeon in 1900. He served the Leeds Corporation for over 40 years, being responsible for the safe supply of milk and inspection of meat in the city.

The doyen of the three, Colonel Butler, who is 90 years of age, was Deputy Medical Officer of Health of the London County Council from 1913 to 1933.

He began his medical career 69 years ago. He was a Medical Officer at the Ministry of Health at the outbreak of the second world war, retiring in 1948 at the age of 80.

Dr. Orr is a former Medical Officer of Health for Ealing. He retired from that post in 1946. He has made a special study of the production of clean milk.

BURNS' SUPPER AT ESKGROVE

The bicentenary of the birth of Robert Burns was celebrated at a supper, held at the Veterinary Laboratory, Eskgrove, Lasswade on January 27th. About 70 members of the staff and friends were present, and among the guests were Mr. J. N. Ritchie, Dr. A. W. Stableforth, Captain N. Bisset, Dr. A. W. Greenwood, Dr. J. Russell Greig, Professor Robertson, Dr. Stamp, Mr. J. Beale, Mr. R. J. Scott, Mr. J. R. McNair, and representatives of the various branches of H.M. Ministry of Works.

The haggis was "piped in" in traditional manner and addressed by Dr. J. E. Wilson, who presided. Captain Bisset proposed the "Immortal Memory" in his inimitable manner. Mr. J. N. Ritchie in an amusing speech toasted "The Lasses." This was followed by a varied programme of country dances, songs and recitations by members of the staff.

ECHO SOUNDERS FOR PIGS

It is reported that echo sounders, comparable to those used by the submarine Nautilus to see how far she was below ice under the North Pole, are being used at research establishments to find the measurements of fat and lean in pigs. This was stated at a bacon conference at Wellington on February 2nd. The conference was organised by the British Oil and Cake Mills advisory service, together with the Newport, Shifnal and Wellington branches of the N.F.U. The information was given by Mr. W. Carr, chief pig adviser of B.O.C.M. who said that the new method of testing fat and lean was by an ultrasonic wave tester—an echo sounder—which was placed on the pig's back. Ultrasonic waves were passed through the animal, and came back on to a cathode ray tube. By taking tests on some 15 to 16 points along the animal's back a general picture of its fat and lean measurements could be obtained.

THE B.S.A.V.A. SECOND ANNUAL CONGRESS

Our readers will note in the advertisement pages of this week's issue that the second Annual Congress of the British Small Animal Veterinary Association takes place from March 20th to 22nd. It will be held at the Washington Hotel, Curzon Street, London, W.1, and an interesting programme has been prepared. It would be invidious to select individual scientific papers, but amongst those of particular general interest will be: "The rôle of the veterinary surgeon in civil defence," "A discussion on practice administration with reference to the principal/assistant relationship," "The survey on fees, with recommendations arising from it," and "The art and teaching of veterinary surgery."

Those veterinary surgeons who have received copies of the Proceedings of the first B.S.A.V.A. Annual Congress would agree that this is a notable volume and its contents form a valuable addition to the literature. The forthcoming second Annual Congress bids fair to be at least of equal interest to the first, and should do every credit to its organisers.

PERSONAL

Marriage

WATT—BEATTIE.—At St. Ninian's Church, Turriff, Aberdeenshire, on January 21st, 1959, Ian Milne Watt, B.SC., M.R.C.V.S., Fernbank, Kintore, to Dorothy Margaret Beattie, 18, Woodlands Crescent, Turriff.

Birth

CORDER.—On February 4th, 1959, at Cuckfield Hospital, Sussex, to Margaret, wife of John Corder, M.R.C.V.S., a daughter.

COMING EVENTS

February

18th (Wed.). Meeting of the Warwickshire Veterinary Club in the Regent Hotel, Leamington Spa, 8 p.m.

Annual General Meeting of the South Eastern Veterinary Association at the Royal Star Hotel, Maidstone, 2.30 p.m.

19th (Thurs.). Meeting of the B.S.A.V.A. Midland Area at the Chace Hotel, Coventry, 7.30 p.m.,

Meeting of the Essex Veterinary Society at the Essex Institute of Agriculture, Writtle, Essex, 7.30 p.m.

General Meeting of the Herts. and Beds. Veterinary Society at the Peahen Hotel, 14 London Road, St. Albans, 7.30 p.m.

25th (Wed.). Meeting of the Southern Counties Veterinary Society at the Royal Hotel, Winchester, 7.45 p.m.

Meeting of the B.S.A.V.A. Metropolitan Region at the Royal Society of Medicine, 1 Wimpole Street, London, W.1, 7 p.m.

97th Annual General Meeting of the Lancashire Veterinary Association at the Veterinary Hospital, University of Liverpool, 2.30 p.m.

Ordinary General Meeting of the Sussex Veterinary Society in the Old Ship Hotel, Brighton, 2.30 p.m.

26th (Thurs.). Annual Ball of Glasgow University Veterinary Association at the Cadoro Restaurant.

Meeting of the Ayrshire Veterinary Association in the Ailsa Lounge, Ayr Station Hotel, 2.30 p.m.

27th (Fri.). Annual Ball of the Liverpool University Veterinary Society in the Students Union.

Annual General Meeting of the Association of Veterinary Teachers and Research Workers at the Royal Veterinary College, Camden Town, London, N.W.1, 2.30 p.m.

March

3rd (Tues.). Dance of the Ladies Guild, South East Midlands Division, V.V.B.F., at the Solarium Restaurant, Overstone, Northampton, 9.30 p.m.

4th (Wed.). Annual General Meeting of the South Wales Division at the Dolwas Restaurant and 6 Guildhall Square, Carmarthen, 2 p.m.

Annual General Meeting of the A.V.T. & R.W.'s (Northern Region) at the Veterinary Hospital, University of Liverpool, 2 p.m.

5th (Thurs.). Spring Meeting of the Dumfries and Galloway Division in the Gretna Hall Hotel, Gretna, 2.15 p.m.

10th (Tues.). Annual General Meeting of the Eastern Counties Veterinary Society at the Bell Hotel, Norwich.

18th (Wed.). Annual General Meeting of the Scottish Metropolitan Division in the Royal (Dick) School of Veterinary Studies, 2.45 p.m.

20th, 21st and 22nd (Fri., Sat. and Sun.). Conference of the British Small Animal Veterinary Association in London.

April

8th, 9th and 10th (Wed., Thurs., and Fri.). B.V.A. Committee and Council Meetings in Edinburgh.

August

30th to 5th September. 77th Annual Congress of the British Veterinary Association in Folkestone. (Official opening Monday, August 31st.)

B.V.A. COMMITTEE AND COUNCIL MEETINGS IN EDINBURGH

Wednesday, April 8th, 1959—at The Royal (Dick) School of Veterinary Studies

10.00 a.m. Farm Livestock Committee.
11.30 a.m. Parliamentary and Public Relations Committee.
2.15 p.m. Small Animals Committee.
5.00 p.m. Finance Sub-committee.

Thursday, April 9th, 1959—at The Royal (Dick) School of Veterinary Studies

10.00 a.m. Home Appointments Committee.
11.30 a.m. Veterinary State Medicine Committee.
2.15 p.m. General Purposes and Finance Committee.

Friday, April 10th, 1959—at The Royal (Dick) School of Veterinary Studies

10.00 a.m. Council Meeting.

PROFESSOR EMERITUS HENRY DRYERRE

We record with regret the death of Professor Emeritus Henry Dryerre, which occurred on February 5th in Edinburgh. He was for many years Professor of Physiology in the Royal (Dick) School of Veterinary Studies, retiring in 1946. It is hoped to publish an appreciation in an early issue of THE VETERINARY RECORD.

ADDRESSES OF DISEASE INFECTED PREMISES

The list given below indicates, first the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Anthrax

Hereford. Little Southend Farm, Mathon (Feb. 5).

Staffs. Manor House Farm, Mavesyn Ridware, Rugeley (Feb. 9).

Fowl Pest

Cambs. Tunbridge Hall, Bottisham (Feb. 4).

Essex. Eight Bells Public House, Belchamp Walter, Halstead; Kings Farm, Pebmarsh; School Farm, Maplestead, Halstead (Feb. 3); Birkett Hall, Woodham Ferrers, Chelmsford; Wickham St. Paul, Halstead (Feb. 4); Perry Grove, Langham, Colchester; The Priory, Borley, Sudbury (Feb. 5); Oakleigh Grounds, Chapel Street, Halstead (Feb. 6); Upper Goulds Farm, Alphamstone (Feb. 7); 332, Straight Road, Shrubend, Colchester; Quarry Farm, Wivenhoe, Colchester (Feb. 8).

Kent. Orstal Farm, Westmarsh Ash, Canterbury (Feb. 5).

Lancs. Hollins House Farm, Hollins, Bury (Feb. 4).

Middx. 5, Bedfont Court Estate, Stanwell, Staines (Feb. 4), 14, Bedfont Court Estate, Stanwell, Staines (Feb. 7).

Norfolk. Millers Farm, Wereham, King's Lynn (Feb. 3); Church Farm, Wretton, King's Lynn; High Street, Wicklewood (Feb. 4); Norwich Road, Yaxham, Dereham (Feb. 6); The Woolpack Inn, Yaxham, Dereham (Feb. 7).

Suffolk. Dyers Green Farm, Great Waldingfield, Sudbury (Feb. 4); The Taflins, Thetford Road, Brandon (Feb. 5); Grange Farm, Chilton, Sudbury; Willow Farm, Glemsford, Sudbury (Feb. 6); Brickwall Farm, The Street, Bulmer, Sudbury (Feb. 7); Brownren Farm, Hitcham, Ipswich (Feb. 8).

Yorks. 1, Croft Cottage, Huby, Sutton-on-the-Forest (Feb. 4).

Swine Fever

Ches. Ledsham Hall Farm, Ledsham, Little Sutton, Wirral (Feb. 4); Moorfields, Rowton; Nook Farm, Appleton; Smithy Farm, Church Road, Saughall (Feb. 5).

Devon. Long Barn, Sandford, Crediton (Feb. 6); Peamore Farm, Exminster (Feb. 9).

Glouc.s. Abbey Farm, Northleach, Cheltenham (Feb. 4); Trinders Barn, Eastington, Northleach (Feb. 6).

Lancs. East Bank Farm, Drummers Dale Lane, Scarisbrick, Ormskirk (Feb. 3).

Middx. 14, Bedfont Court Estate, Stanwell, Staines (Feb. 6).

ERRATUM

It is regretted that in the provisional Congress Programme published last week the qualifications of two authors were not properly set out. In the symposium on Johne's disease the paper "Diagnosis" will be presented by Mrs. M. H. Maclay, M.R.C.V.S., and N. H. Hole, B.SC., M.R.C.V.S.

Letters to the Editor

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

GENERAL

"Tranquillisers" for Shows

Sir,—Before the recent correspondence in your journal regarding the use of tranquillising drugs at shows, the Preliminary Investigation and Advisory Committee of the Council of the Royal College of Veterinary Surgeons had considered this matter and had corresponded with the secretary of the Kennel Club regarding clause 2 of the Club Regulations for the Preparation of Dogs for Exhibition. This states that nothing may be done which is calculated, in the opinion of the Kennel Club committee, to deceive.

The secretary to the Kennel Club consulted his committee and wrote as follows:—

"I am instructed by my committee to point out that the Kennel Club Regulations for the preparation of dogs for exhibition contain a clause that nothing may be done calculated in the opinion of the committee of the Kennel Club to deceive. The behaviour of a dog in the show ring is a very important factor and if a drug is administered to a dog which has the effect of making it behave in a way which is not natural then my committee would consider this to be an action calculated to deceive under these regulations."

The Preliminary Investigation and Advisory Committee of my Council support the view expressed by the committee of the Kennel Club, and in view of the correspondence which has appeared in your columns, desires to bring this opinion to the attention of the veterinary profession forthwith.

Yours faithfully,
W. G. R. OATES.
Registrar.

Royal College of Veterinary Surgeons,
9 and 10, Red Lion Square,
London, W.C.1.
February 6th, 1959.

A Treatment for Certain Ear Conditions

Sir,—For the past 7 months we have been conducting a trial of a new product* used for the treatment of accumulation of wax in the ears of dogs and cats. The formula includes paradichloro-benzene B.P.C. 2 gm. benzocaine B.P. 15 c.c., gammexane B.P. 2 per cent. active constituents per 100 c.c.

As this product has been found to be exceedingly good also in certain ear conditions not readily curable and which are common in dogs and cats, it was felt advisable to bring this product to the attention of your readers.

At first, all cases of otitis were treated, but it was soon clear that two main types responded best, namely, parasitic mange and accumulation and hardening of wax secretion causing irritation.

Parasitic mange in the ears of cats and dogs causes the production of large amounts of a dark brown material which gradually hardens into flakes. It adheres to the hair growing in the canal and protects the mite from most oily or watery medicaments. The more hair growing in the canal the harder it is to clear. Poodles are especially awkward to clear because of this. It is not easy to clean the ear thoroughly with forceps and wool because the secretion is hard. The product in question was found especially useful because of its property of dissolving wax. It was found that if the owner applied it, 2 or 3 drops daily, then in 5 to 7 days the wax had dissolved, cleaning was easily accomplished, and as the product contains gammexane no other treatment was necessary.

In accumulation of wax the symptoms are similar to parasitic mange. The animal shakes its head and scratches at the ears. The secretion is brown but not so dark as that in mange, and it is hard. It is more common in dogs than cats. The aetiology is not clear but it is thought that in many cases it starts as a mild type of eczema, for it is seen more often in animals on a high protein diet not properly balanced with carbohydrates. At any rate, once the wax accumulates it forms a constant source of irritation until removed. The lotion was very successful in these cases and often no cleaning with forceps and wool was necessary: dispensing a bottle to be applied daily usually relieved the symptoms.

Up to date 13 cats and 30 dogs have been treated with this preparation. Three cats and 2 dogs appeared to resent the medication and the owners discontinued the treatment. In all other animals good results were obtained. The medicament is contra-indicated in ulcerated otitis.

Further trials are in progress and our findings will be communicated at a later date.

Yours faithfully,
W. J. JORDAN.

Green Paddocks,
Pulford,
Nr. Chester.
February 9th, 1959.

* "Ceruvet," manufactured by Laboratories for Applied Biology Ltd., London.

"Mulberry Heart" and Herztod Disease of Swine

Sir,—I am engaged on a study of the histopathology of Mulberry Heart disease of swine and am anxious to compare the lesions with those of Herztod.

May I appeal to any of your readers who encounter cases of unequivocal Herztod to send me specimens, preferably fixed in 10 per cent. buffered neutral formalin. I am particularly interested in the myocardium and thyroid, but would be grateful for any other tissues as well.

I would, of course, be delighted to reciprocate with specimens of Mulberry Heart disease or any other tissues at my disposal.

Yours faithfully,
J. D. J. HARDING.

Ministry of Agriculture, Fisheries and Food,
New Haw,
Weybridge, Surrey.
February 4th, 1959.

Meat Regulations

Sir,—On April 1st the Statutory Instrument 1959 (No. 20) Meat (Staining and Sterilisation) Regulations, 1959, comes into force, by which it will be illegal (with certain exceptions) for knackermen to sell meat, unless it is boiled.

The passing of these regulations appears not to have been noticed by the general public, nor can I find any reference to them in the veterinary press, and there are certain points which should be raised as the enforcement of the Regulations will affect us all.

1. The cost of knackermeat will most certainly rise considerably.
2. Knackermen will become even more selective about the carcases they will pick up.
3. Many small knackermen will be forced out of business, thereby increasing the distances we have to travel to carry out *post-mortem* examinations. The remaining knackermen may not find it convenient to wait for us to turn up to carry out *post mortems*.
4. The price paid by the knackermen to the farmer will become even lower, and beasts which are, at the moment sold alive to the knacker, will find their way into markets.
5. For those of us with kennels, the increased price of meat, the loss of the gravy with which to flavour biscuit, and the increased difficulty in identifying unfit meat, must all be considered.

Yours faithfully,

Old Sarum House, PETER J. DALTON.
Stratford Road,
Salisbury.

February 9th, 1959.

[Our correspondent is mistaken in his second paragraph. The Regulations were noted in THE VETERINARY RECORD of January 17th, page 55.—*Editor*.]

SCIENTIFIC

Immunisation of Lambs against *Clostridium welchii* type D Enterotoxaemia (Pulpy Kidney Disease)

Sir,—During 1957 and 1958 we have carried out studies on the vaccination of pregnant ewes against pulpy kidney disease, to establish the efficacy of this treatment on the offspring and the effect of any consequent passive immunity on their subsequent active immunisation. For this purpose we used a purified *Clostridium welchii* type D aluminium hydroxide treated toxoid.* Taking 0.2 units of *Cl. welchii* ε-antitoxin per ml. serum as the minimum indication of immunity, we found that all of the 58 lambs born to ewes vaccinated during pregnancy were immune at birth and 5 weeks later.

The 58 lambs were divided into 3 groups:—

1. 20 lambs receiving a single injection, 2 ml., of the toxoid when they were 5 weeks old;
2. 19 lambs receiving the same injection as those in group 1 and a second identical injection 4 weeks later;
3. 19 lambs untreated.

Of the lambs in group 3, 2 lost their immunity at 9 weeks of age, 4 more at 11 weeks, and 5 more at 15 weeks of age. Of the lambs in group 1, all were still immune at 13 weeks of age but 3 had lost their immunity 2 weeks later. All the lambs in group 2 were still immune at 15 weeks of age.

From these and other observations we hold that the best method of establishing and maintaining an adequate level of *Cl. welchii* ε-antitoxin in the whole of a breeding flock of sheep is to render the ewes immune by injecting toxoid during their pregnancy. One injection should be given, preferably within the last month of pregnancy, to animals previously immunised; the other should receive 2 injections, the second during the last month of pregnancy: active immunisation of their lambs should begin when these are about 5 weeks old.

When lambs are slaughtered at about 3 months they may safely be considered immune after the single injection of toxoid at about 5 weeks old. Those lambs kept for feeding and fattening, or as breeding stock replacement, should be injected a second time with the toxoid, but not within 4 weeks of the first. These animals would later only require a single further injection of toxoid to reinforce their immunity or to act in the ewes as the annual "booster" injection during pregnancy.

Further details of the work outlined above will be found in a later publication (Hepple, J. R., Chodnik, K. S., and Price E. K.: *Vet. Rec.*, 1959, in press).

Yours faithfully,

JAMES R. HEPPLE.
K. S. CHODNIK.

Glaxo Laboratories Ltd.,
Greenford.

E. K. PRICE.

Royal Veterinary College,
London.

February 10th, 1959.

* "Saffelin," Glaxo Laboratories Ltd.

DISEASES OF ANIMALS ACT, 1950—GREAT BRITAIN

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period		Anthrax	Atrophic Rhinitis	Foot-and-Mouth	Fowl Pest	Sheep Scab	Swine Fever
16th to 31st Dec., 1958		11	—	—	54	—	39
Corresponding period in	1957	11	1	19	75	—	39
	1956	15	—	7	72	—	23
	1955	17	1	2	137	—	31
1st Jan. to 31st Dec., 1958		167	5	116	759	—	1,263
Corresponding period in	1957	318	9	184	1,034	—	960
	1956	1,245	11	162	956	—	741
	1955	764	8	9	906	—	1,403